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INVENTIONS IN OUTER SPACE

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Mr. BIDEN, from the Committee on the Judiciary, submitted the following

REPORT

[To accompany S. 459]

The Committee on the Judiciary, to which was referred the bill (S. 459) to amend title 35, United States Code, with respect to the use of inventions in outer space, having considered the same, reports favorably thereon, with an amendment in the nature of a substitute, and recommends that the bill, as amended, do pass.

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The amendment is as follows:

Strike all after the enacting clause and insert the following:

SECTION 1. INVENTIONS IN OUTER SPACE.

(a) IN GENERAL.—Chapter 10 of title 35, United States Code, is amended by adding at the end the following:

"§ 105. Inventions in outer space

"(a) Any invention made, used or sold in outer space on a space object or component thereof under the jurisdiction or control of the United States shall be considered to be made, used or sold within the United States for the purposes of this title, except with respect to any space object or component thereof that is specifically identified and otherwise provided for by an international agreement to which the United States is a party, or with respect to any space object or component thereof

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that is carried on the registry of a foreign state in accordance with the Convention on Registration of Objects Launched into Outer Space.

"(b) Any invention made, used or sold in outer space on a space object or component thereof that is carried on the registry of a foreign state in accordance with the Convention on Registration of Objects Launched into Outer Space, shall be considered to be made, used or sold within the United States for the purposes of this title if specifically so agreed in an international agreement between the United States and the state of registry.".

(b) TABLE OF CONTENTS.—The table of sections of chapter 10 of title 35, United States Code, is amended by adding at the end the following:

"105. Inventions in outer space.".

SEC. 2. SPECIAL RULES.

(a) EFFECTIVE DATE.—Subject to subsections (b), (c), and (d) of this section, the amendments made by the first section of this Act shall apply to all United States patents granted before, on, or after the date of enactment of this Act, and to all applications for United States patents pending on or filed on or after such date of enactment.

(b) FINAL DECISIONS.—The amendments made by the first section of this Act shall not affect any final decision made by a court or the Patent and Trademark Office before the date of enactment of this Act with respect to a patent or an application for a patent, if no appeal from such decision is pending and the time for filing an appeal has expired.

(c) PENDING CASES.—The amendments made by the first section of this Act shall not affect the right of any party in any case pending in a court on the date of enactment of this Act to have the party's rights determined on the basis of substantive law in effect before such date of enactment.

(d) NON-APPLICABILITY.—The amendments made by the first section of this Act shall not apply to any process, machine, article or manufacture, or composition of matter, an embodiment of which was launched prior to the date of enactment of this Act.

Amend the title so as to read:

To amend title 35, United States Code, with respect to the use of inventions in outer space.

I. PURPOSE

The purpose of S. 459 is to clarify U.S. patent law with respect to its extraterritorial application aboard U.S.-flag spacecraft, in order to encourage private investment in research and manufacture conducted in outer space.

II. LEGISLATIVE HISTORY

Legislation addressing inventions in outer space was first introduced in the Senate by Senator Riegle on February 5, 1987. This bill was referred to the Committee on the Judiciary, but no action was taken. Similar legislation has twice passed the House of Representatives, once on September 18, 1986, and again on October 5, 1988. These measures were referred to the Committee on the Judiciary, but no action was taken.

S. 459 was introduced in the Senate by Senator Gore on February 28, 1989. On that date the bill was referred to the Judiciary Subcommittee on Patents, Copyrights and Trademarks. On July 26, 1989, the subcommittee approved the bill, with an amendment in the nature of a substitute. The full committee approved the bill on March 22, 1990, by a voice vote.

III. Discussion

COMMERCIALIZATION OF SPACE

On July 24, 1984, the Reagan administration announced a national policy to encourage commercial use of outer space. Subsequent to this announcement, it has been policy of the Government to promote private sector investment in outer space projects. The approach taken to accomplish this goal has been to foster a regulatory atmosphere conducive to commercialization of space. Private research initiatives have been encouraged aboard U.S. spacecraft, including the space shuttle and the planned multinational space station. It is believed that such research, conducted in the microgravity of outer space, will uncover many innovative products and processes beneficial to high technology industries.

For example, recent experiments aboard the space shuttle indicate that crystallization of biological molecules proceeds more efficiently in the microgravity of outer space.[1] Such biological crystals allow enhanced x-ray diffraction studies of protein structure, and are expected to benefit the biotechnology industry by facilitating design of genetically engineered proteins. The microgravity crystallization process may also become important in purification of pharmaceutical products. This crystallization is accomplished by a proprietary process that should be proper subject matter for a U.S. patent claim. S. 459 is calculated to clarify the law with respect to such innovations, and thus offer an incentive to their development and disclosure. As one commentator has observed, "just as on Earth, patents can serve as an important stimulus to industrial progress in outer space." [2]

EXTRATERRITORIAL APPLICATION OF THE PATENT LAWS

Article I, section 8, clause 8 of the U.S. Constitution empowers Congress to promote the development of science and the useful arts by granting a limited monopoly to inventors. Such patents offer an economic incentive to foster creativity, and are granted in return for disclosure of the invention. To qualify for a patent under title 35 of the U.S. Code, the invention must be novel, useful, and nonobvious. In other words, the invention must be the first of its kind, it must be functional, and it must be a significant advancement over the prior art. Once an inventor is granted a valid U.S. patent, he may exclude anyone from the manufacture, use, or sale of the patented invention for a period of 17 years. It is beneficial for the United States that this incentive be available to spur industry and innovation in outer space. However, the current state of the patent law is ambiguous with respect to jurisdiction over activities in outer space.

This ambiguity stems from the patent law's territorial application. 35 U.S.C. 100(c) provides that for purposes of the patent law:

> The terms "United States" and "this country" mean the United States of America, its territories and posessions.

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[1] *See* De Lucas, Smith, et. al., *Protein Crystal Growth in Microgravity*, 246 Science 651 (1989).

[2] Helfman, *Patents in Space: Encouraging and Protecting Out-of-This-World Investments* in American Enterprise, the Law, and the Commercial Use of Space, vol. III (P.D. Mink, ed. 1987).

Although this language was intended to be descriptive rather than limiting, the U.S. Supreme Court has stated that "our patent system makes no claim to extraterritorial effect." [3]

However, some caselaw supports the proposition that the decks of U.S.-flag vessels may be treated as U.S. territory for jurisdictional purposes in patent infringement proceedings. A court held in the case of *Gardiner* v. *Howe,*[4] that patent law jurisdiction extended to the deck of a U.S.-flag vessel on the high seas. Similarly, in *Marconi Wireless Telephone Co.* v. *United States,*[5] jurisdiction of U.S. patent law was extended to activities on the grounds of the American Legation at Peking.

Some commentators have suggested that the holdings of these cases could be extended by analogy to activities aboard U.S.-flag spacecraft.[6] Others have cautioned that more recent decisions appear to have retreated from territorial rationale found in previous holdings.[7] For example, the U.S. Court of Claims in *Decca Ltd.* v. *United States* [8] cautioned against application of this territorial principle to orbiting satellite technology. Noting that the law has changed since *Gardiner,* the *Decca* court stated in dicta:

> In view of the foregoing, we think a decision founded on the fiction that for purposes of the Patent Laws, United States ships and planes wherever found are United States territory, would be founded on water.[9]

The *Gardiner* rationale was again disapproved of by the Court of Claims in a subsequent case, *Ocean Science & Engineering* v. *U.S.* [10] The court suggested the need for a clear signal from Congress on the matter:

> Of course, the constitutional power of Congress to make our patent laws applicable to processes carried out on U.S. flag ships and planes at sea is not challenged; the question is whether Congress has done so in view of the Supreme Court's view of strict construction. Perhaps the patent bar will note the possible loophole in the coverage of the U.S. patent laws and will invite the attention of Congress to it. Meanwhile, it is well to adjudicate cases on other grounds when possible, as we do in this case.[11]

In addition, numerous decisions in other areas of the law have declined to uphold this rationale with regard to United States flag ships and aircraft. For example, in *Air Line Stewards and Stewardesses Association* v. *Northwest Airlines,*[12] the court declined to

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[3] *Deepsouth Packing Co.* v. *The Laitram Corporation,* 406 U.S. 518, 531 (1972) (supreseded on other grounds by Patent Amendments Act of 1984, Pub. L. No. 98-622, 98 stat. 3383).

[4] 9 Fed. Cas. 1157 (C.C.D. Mass. 1865).

[5] 53 U.S.P.Q. 246, 259 (Ct. Cl. 1942) *vacated and remanded on other grounds,* 320 U.S. 1 (1944).

[6] *See, e.g.,* Saragovitz, *The Law of Intellectual Property in Outer Space,* 17 *Idea* 86, 88-94 (1975).

[7] *See, e.g.,* Statement of Professor Glenn H. Reynolds, University of Tennessee College of Law, before the U.S. House of Representatives Judiciary Subcommittee on Courts, Intellectual Property, and the Administration of Justice, Wednesday, Oct. 4, 1989.

[8] 191 U.S.P.Q. 439, 442 (Ct. Cl. 1976).

[9] 191 U.S.P.Q. at 442.

[10] 595 U.S. 572 (Ct. Cl. 1979).

[11] 595 F.2d at 574.

[12] 267 F.2d 170 (8th Cir. 1959).

apply the Railway Labor Act to U.S.-flag Aircraft operating outside the United States, stating that:

> [w]e have in mind the rule that unless there is an explicit and unequivocal showing of contrary intent, Acts of Congress are to be given an interpretation which is domestic in nature.[13]

Consequently, the proposition that U.S. patent law may be applied to activities aboard U.S. spacecraft, simply because spacecraft are analogous to ocean vessels, is uncertain at best. Some clarification from Congress is needed. Without such a clarification, protection for outer space innovations may be found lacking.

This situation could be detrimental to inventors in at least three instances where U.S. patent law does not recognize extraterritorial activity.[14] First, U.S. inventors may have difficulty establishing priority of invention if the activities determining conception of the invention, reduction to practice, and diligence took place in outer space. Second, activities in outer space relevant to the prior art of a patent application could not be raised in an interference proceeding. Finally, the holder of a valid U.S. patent would be unable to enjoin or collect damages for infringing activities conducted in outer space. Uncertainty as to the application of the patent law in these areas may chill prospects for commercial investment in outer space research and manufacturing.

THE EFFECT OF INTERNATIONAL TREATIES

The United States is signatory to international treaties governing the exploration of outer space. These international obligations further obscure the applicability of the territorial principle to patent law in outer space. For example, article I of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Space, Including the Moon and Other Celestial Bodies (Outer Space Treaty) [15] encourages international cooperation in assuring scientific freedom in outer space. Article II prohibits any nation from claiming sovereignty over areas of outer space. Article XI of the treaty requires that states report the nature, conduct, and results of space explorations to the Secretary General of the United Nations, who will in turn disseminate the information. One commentator has suggested that these treaty provisions could be read together to preclude patent protection based on territoriality.[16]

Other analyses of these international agreements reach a different conclusion. Article I of the Outer Space Treaty provides that space is free for exploration and use by all states, yet under article VIII, states retain jurisdiction and control over objects launched into outer space, and over personnel aboard such objects. Article VIII also specifies that ownership of objects do not change merely because they are launched into outer space. Moreover, under article VII, states are liable for the damages caused by objects or per-

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[13] 267 F.2d at 176.
[14] *See* G. Reynolds and R. Merges, *Outer Space: Problems of Law and Policy*, 286–88 (1989).
[15] Oct. 10, 1967, 18 U.S.T. 2410, T.I.A.S. 6347, 610 U.R.T.S. 205.
[16] *See* Helfman, *Supra*, at 133.

sonnel under their jurisdiction and control. These provisions support the proposition that outer space is available for use by all, but that property rights, both tangible and intangible may be protected.

S. 459 should clearly demonstrate congressional intent with respect to the patent law as applied to activities in outer space. S. 459 is intended to extend the protection of U.S. patent law to applicable activities conducted in outer space. It is anticipated that this clarification of the intellectual property law will significantly encourage scientific discovery and innovation in outer space.

IV. Vote of the Committee

On March 22, 1990, the full Judiciary Committee favorably reported S. 459 by a unanimous voice vote.

VI. Section-by-Section Analysis

Section 1 provides that any invention made, used, or sold on a space object in outer space shall be considered to have been made, used, or sold within the United States in two cases.

The first case hinges on U.S. jurisdiction or control. Specifically, activities occurring on space objects under the "jurisdiction or control" of the United States are considered to have occurred in the United States; unless one of the two following exceptions apply.

First, an invention made, used, or sold on a space object or component thereof under the jurisdiction or control of the United States while in outer space will not be considered to have been made, used, or sold in the United States if such object or component thereof is specifically identified and otherwise provided for in an international agreement to which the United States is a party. Such exception may be for one or more of the purposes of title 35 relating to either the making, using, or selling of an invention in the United States, as applicable.

The flexibility provided by this exception is considered important in negotiating international agreements relating to cooperative activities in outer space. It is particularly desirable with respect to various national laws requiring the review of filed patent applications for national security and related purposes.

For example, in the Intergovernmental Space Station Agreement the parties have agreed that, under certain specified conditions, they will not apply laws on elements registered by them that could prevent or delay the filing of patent applications in other countries for inventions made by persons not their nationals or residents. In the United States, this provision would apply to 35 U.S.C. 184 and similar statutes governing the filing of a patent application in a foreign country. This exception therefore will enable the United States to implement this aspect of the Space Station Agreement.

The second exception provides that an invention made, used, or sold on a space object or component thereof under the jurisdiction or control of the United States while in outer space will not be considered to have been made, used, or sold in the United States if such object or component is registered by a foreign state in accord-

ance with the convention on Registration of Objects Launched into Outer Space (Registration Convention).[17]

Under article VIII of the Outer Space Treaty,[18] a state that registers a space object including components thereof retains jurisdiction and control over the object. This second exception has been added to clarify the fact that use of the phrase "jurisdiction or control" in the legislation, as opposed to "jurisdiction and control" as used in article VIII of the Outer Space treaty in reference to registered objects, is not intended to mean that the invention-related activities of section 105 would be considered to have occurred in the United States if occurring on a space object carried on the registry of a foreign state, even if such space object may otherwise be considered under either the "jurisdiction" or the "control" of the United States. Registration by the United States, in any event, is to be taken as determinative of U.S. jurisdiction and control unless the first exception is applicable.

Section 1(b) provides a second basis for considering the invention-related activities of section 105 to have occurred in the United States. Unlike section 1(a), section 1(b) is not dependent on U.S. jurisdiction or control. Rather, inventions used, made, or sold on any space object or component thereof, irrespective of U.S. jurisdiction or control, may be considered to have been made, used, or sold in the United States where an international agreement between the United States and the State of registry specifically so provides.

This additional exception is intended to offer a domestic legal basis for implementing agreements with a foreign state of registry that provide for the application of section 105 to space objects registered by that state. This second exception is the converse or complement to the first exception for those space objects that are under the jurisdiction or control of the United States but are otherwise provided for in an international agreement.

The term "space object" is used as defined in the Registration Convention. It has been substituted for the term "aeronautical and space vehicle," first, because it is a term used in the relevant international space treaties, and second, in order to avoid the possibility that the term "vehicle" may be interpreted more restrictively than the term "object." A space object is carried on the registry of a state if that state has registered in accordance with the Registration Convention. So as to be consistent with U.S. treaty obligations, the terms "foreign state" and "state of registry" includes an international intergovernmental organization that complies with article VII of the Registration Convention.

The phrases "international agreement to which the United States is a party," and, "an international agreement between the United States and the State of registry," could include, in addition to intergovernmental agreements, international agreements between a Federal agency of the U.S. Government and their foreign counterparts, incuding foreign governmental agencies or international organizations.

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[17] Sept. 15, 1976, 28 U.S.T. 695, T.I.A.S. 8480, 1023 U.R.T.S. 15.

[18] Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, Jan. 27, 1967, 18 U.S.C. 2410, T.I.A.S. 6347, 610 (effective Oct. 10, 1967).

The terms "made," "used," and "sold" are intended to have the same meaning as used elsewhere in title 35. In this respect, "made" can refer to activities establishing conception or first actual reduction to practice of an invention, pursuant to sections 104, 184, or 201(g). "Made" may also refer to the making of an invention as used in sections 154 and 271.

VI. Agency Views

The Subcommittee on Patents, Copyrights and Trademarks has received statements of support for this bill from the National Aeronautics and Space Administration, from the U.S. Department of State, and from the U.S. Patent and Trademark Office.

VII. Cost Estimate

In accordance with paragraph 11(a), rule XXVI, of the Standing Rules of the Senate, the committee offers the report of the Congressional Budget Office:

U.S. Congress,
Congressional Budget Office,
Washington, DC, March 28, 1990.

Hon. Joseph R. Biden, Jr.,
Chairman, Committee on the Judiciary,
U.S. Senate, Washington, DC.

Dear Mr. Chairman: The Congressional Budget Office has reviewed S. 459, a bill to amend title 35, United States Codes, with respect to the use of inventions in outer space, as ordered reported by the Senate Committee on the Judiciary, March 22, 1990.

S. 459 would apply U.S. patent laws to activities that occur in outer space aboard a vehicle under the jurisdiction of the United States, unless otherwise provided for by an international agreement.

Based on information from the Patent and Trademark Office and the National Aeronautics and Space Administration, CBO estimates that enactment of this bill would result in no significant additional costs to the federal government and in no cost to state or local governments.

If you wish further details on this estimate, we will be pleased to provide them. The CBO staff contact is Michael Sieverts, who can be reached at 226-2860.

Sincerely,

James L. Blum
(For Robert D. Reischauer.)

VIII. Regulatory Impact Statement

Pursuant to paragraph 11(b), rule XXVI, of the Standing Rules of the Senate, the Committee, after due consideration, concludes that this act will not have direct regulatory impact.

IX. Changes in Existing Law

In compliance with paragraph 12 of rule XXVI, of the Standing Rules of the Senate, changes in existing law made by S. 459 as re-

ported are as follows (new matter is printed in italic; existing law in which no change is proposed is shown in roman):

UNITED STATES CODE

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TITLE 35—PATENTS

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Chapter 10—Patentability of Inventions

Sec.
100. Definitions.
101. Inventions patentable.
102. Conditions for patentability; novelty and loss of right to patent.
103. Conditions for patentability; non-obvious subject matter.
104. Invention made abroad.
105. Inventions in outer space.

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§ 105. Inventions in outer space

(a) Any invention made, used or sold in outer space on a space object or component thereof under the jurisdiction or control of the United States shall be considered to be made, used or sold within the United States for the purposes of this title, except with respect to any space object or component thereof that is specifically identified and otherwise provided for by an international agreement to which the United States is a party, or with respect to any space object or component thereof that is carried on the registry of a foreign state in accordance with the Convention on Registration of Objects Launched into Outer Space.

(b) Any invention made, used or sold in outer space on a space object or component thereof that is carried on the registry of a foreign state in accordance with the Convention on Registration of Objects Launched into Outer Space, shall be considered to be made, used or sold within the United States for the purposes of this title if specifically so agreed in an international agreement between the United States and the state of registry.

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